

1 Understand numbers, ways of representing numbers, relationships among numbers and number systems				
GRADE K -2		GRADE 3 - 5	GRADE 6-8	GRADE 9-12
A	Counts	Count and recognize “how many” in a set of objects	Count and recognize “how many” in a set of objects	Count and recognize “how many” in a set of objects
	<p>NO1.0. Explore quantity using manipulatives.</p> <p>NO1.1. Represent and number small collections (1-4) items.</p> <p>a. Recognize a small collection of one or two items (e.g., pointing to one or two items).</p> <p>b. Recognize a small collection up to “four” items.</p> <p>c. Show one or two items (e.g., responds to a verbal request for one or two items by offering quantity or holding up two fingers).</p> <p>d. Show up to four items (e.g., responds to a verbal request for four items by offering quantity or holding up four fingers).</p>	<p>NO1.0. Explore quantity using manipulatives.</p> <p>NO1.1. Represent and number small collections (1-4) items.</p> <p>a. Recognize a small collection of one or two items (e.g., pointing to one or two items).</p> <p>b. Recognize a small collection up to “four” items.</p> <p>c. Show one or two items (e.g., responds to a verbal request for one or two items by offering quantity or holding up two fingers).</p> <p>d. Show up to four items (e.g., responds to a verbal request for four items by offering quantity or holding up four fingers).</p>	<p>NO1.0. Explore quantity using manipulatives.</p> <p>NO1.1. Represent and number small collections (1-4) items.</p> <p>a. Recognize a small collection of one or two items (e.g., pointing to one or two items).</p> <p>b. Recognize a small collection up to “four” items.</p> <p>c. Show one or two items (e.g., responds to a verbal request for one or two items by offering quantity or holding up two fingers).</p> <p>d. Show up to four items (e.g., responds to a verbal request for four items by offering quantity or holding up four fingers).</p>	<p>NO1.0. Explore quantity using manipulatives.</p> <p>NO1.1. Represent and number small collections (1-4) items.</p> <p>a. Recognize a small collection of one or two items (e.g., pointing to one or two items).</p> <p>b. Recognize a small collection up to “four” items.</p> <p>c. Show one or two items (e.g., responds to a verbal request for one or two items by offering quantity or holding up two fingers).</p> <p>d. Show up to four items (e.g., responds to a verbal request for four items by offering quantity or holding up four fingers).</p>
Read, Write, and Compare Numbers	<p>NO1.2. Use number words together to create the counting sequence by ones.</p> <p>a. Start counting sequence with one (e.g., one, two....).</p> <p>b. Use counting sequence to show correct sequence up to 10.</p>	<p>NO1.2. Use number words together to create the counting sequence by ones.</p> <p>a. Start counting sequence with one (e.g., one, two....).</p> <p>b. Use counting sequence to show correct sequence up to 25.</p>	<p>NO1.2. Use number words together to create the counting sequence by ones.</p> <p>a. Start counting sequence with one (e.g., one, two....).</p> <p>b. Use counting sequence to show correct sequence up to 100.</p>	<p>NO1.2. Use number words together to create the counting sequence by ones.</p> <p>a. Start counting sequence with one (e.g., one, two....).</p> <p>b. Use counting sequence to show correct sequence up to 100 and beyond.</p>
	<p>NO1.3. Use the counting sequence to enumerate (count one by one) a collection and to identify “how many” items in a collection.</p> <p>a. Demonstrate one-to-one correspondence between objects and counting words.</p> <p>b. Keep track of counted and uncounted objects so that each object is tagged only once.</p>	<p>NO1.3. Use the counting sequence to enumerate (count one by one) a collection and to identify “how many” items in a collection.</p> <p>a. Demonstrate one-to-one correspondence between objects and counting words.</p> <p>b. Keep track of counted and uncounted objects so that each object is tagged only once.</p>	<p>NO1.3. Use the counting sequence to enumerate (count one by one) a collection and to identify “how many” items in a collection.</p> <p>a. Demonstrate one-to-one correspondence between objects and counting words.</p> <p>b. Keep track of counted and uncounted objects so that each object is tagged only once.</p>	<p>NO1.3. Use the counting sequence to enumerate (count one by one) a collection and to identify “how many” items in a collection.</p> <p>a. Demonstrate one-to-one correspondence between objects and counting words.</p> <p>b. Keep track of counted and uncounted objects so that each object is tagged only once.</p>
	<p>NO1.4. Represent and number collections of items.</p> <p>a. Show 1 to 10 items.</p>	<p>NO1.4. Represent and number collections of items.</p> <p>a. Show 1 to 25 items.</p> <p>b. Demonstrate that the final number said when counting objects is the quantity of the set (cardinality).</p>	<p>NO1.4. Represent and number collections of items.</p> <p>a. Show 1 to 100 items.</p> <p>b. Demonstrate that the final number said when counting objects is the quantity of the set (cardinality).</p>	<p>NO1.4. Represent and number collections of items.</p> <p>a. Show 1 to 100 items and beyond.</p> <p>b. Demonstrate that the final number said when counting objects is the quantity of the set (cardinality).</p>
		<p>NO1.5. Flexibly cite numbers for counting.</p> <p>a. Count by ones forward from a number other than one.</p> <p>b. Indicate the number after a specified count term (e.g., “What comes after 1, 2, 3, 4, and 5?” “Say the numbers after 10”).</p> <p>c. Count by ones backwards (e.g. 10, 9, 8...).</p> <p>d. Indicate the number before a specified count term (e.g., “What number comes before 12?”).</p>	<p>NO1.5. Flexibly cite numbers for counting.</p> <p>a. Count by ones forward from a number other than one.</p> <p>b. Indicate the number after a specified count term (e.g., “What comes after 1, 2, 3, 4, and 5?” “Say the numbers after 23”).</p> <p>c. Count by ones backwards (e.g. 10, 9, 8...).</p> <p>d. Indicate the number before a specified count term (“What number comes before 23?”). (e.g., uses number chart).</p>	<p>NO1.5. Flexibly cite numbers for counting.</p> <p>a. Count by ones forward from a number other than one.</p> <p>b. Indicate the number after a specified count term (e.g., “What comes after 1, 2, 3, 4, and 5?” “Say the numbers after 230”).</p> <p>c. Count by ones backwards (e.g. 10, 9, 8...; 30, 29, 28...).</p> <p>d. Indicate the number before a specified count term (“What number comes before 23 or 283?”). (e.g., uses number chart).</p>
		Read, write, and compare whole numbers	Read, write, and compare whole numbers	Read, write, and compare whole numbers
		<p>NO1.6. Represent a number or quantity (e.g., tap, draw objects or tallies).</p>	<p>NO1.6. Represent a number or quantity (e.g., tap, draw objects or tallies).</p>	<p>NO1.6. Represent a number or quantity (e.g., tap, draw objects or tallies).</p>

1 Understand numbers, ways of representing numbers, relationships among numbers and number systems ---- continued				
	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
		<p>NO1.7. Discriminate between numerals and other printed symbols.</p> <p>NO1.8. Identify/recognize numerals 1-10 (e.g., is able to point out a “five” given a choice of numerals).</p> <p>NO1.9. Communicate 1-9 numerals (e.g., write, use number cards, communication board).</p> <p>NO1.10. Use 1-9 numerals to represent the cardinal value (how many) of a collection.</p> <p>NO1.11. Appropriately label the quantity of an empty set (e.g., “0”, “none”, “nothing”).</p> <p>NO1.12. Identify a 2 digit number.</p> <p>NO1.13. Communicate 2 digit numbers</p> <p>NO1.14. Use written numbers or words up to (1-20) to represent the cardinal value of a collection.</p> <p>Compare whole numbers</p> <p>NO1.18. Recognize or request more and less of something (e.g., identify which glass has more or less milk).</p> <p>NO1.19. Compares two quantities (up to four items) as same or more. The perceptual cue for the arrangement of objects needs to be salient (e.g., such as organizing objects by two side by side rows).</p> <p>NO1.20. Use counting to compare two quantities (up to four items) as same or more (number-identity principle).</p> <p>NO1.21. Recognize equivalent collections of two or more items despite appearances and/or arrangement (number conservation).</p> <p>NO1.22. Use larger number principle – the later a number (word or symbol) appears in the counting sequence, the larger the collection it represents (e.g., make total comparisons of “more” or “less” for two collections with one collection equaling 5, 10 or up to 25 items).</p> <p>NO1.23. Demonstrate an understanding of the relation of inequality when comparing whole numbers by using “1 more,” “1 less,” “10 more,” “10 less.”</p> <p>NO1.24. Compare whole numbers to each other or to landmark whole numbers (10, or 25).</p> <p>NO1.25. Identify the larger of two written numbers.</p>	<p>NO1.7. Discriminate between numerals and other printed symbols.</p> <p>NO1.8. Identify/recognize numerals 1-10 (e.g., is able to point out a “five” given a choice of numerals).</p> <p>NO1.9. Communicate 1-9 numerals (e.g., write, use number cards, communication board).</p> <p>NO1.10. Use 1-9 numerals to represent the cardinal value (how many) of a collection.</p> <p>NO1.11. Appropriately label the quantity of an empty set (e.g., “0”, “none”, “nothing”).</p> <p>NO1.12. Identify a 2 digit number.</p> <p>NO1.13. Communicate 2 digit numbers</p> <p>NO1.14. Use written numbers or words up to (1-100) to represent the cardinal value of a collection.</p> <p>NO1.15. Identify a 3 digit number.</p> <p>NO1.16. Communicate 3 digit numbers.</p> <p>NO1.17. Identify the larger of two written numbers.</p> <p>Compare whole numbers</p> <p>NO1.18. Recognize or request more and less of something (e.g., identify which glass has more or less milk).</p> <p>NO1.19. Compares two quantities (up to four items) as same or more. The perceptual cue for the arrangement of objects needs to be salient (e.g., such as organizing objects by two side by side rows).</p> <p>NO1.20. Use counting to compare two quantities (up to four items) as same or more (number-identity principle).</p> <p>NO1.21. Recognize equivalent collections of two or more items despite appearances and/or arrangement (number conservation).</p> <p>NO1.22. Use larger number principle – the later a number (word or symbol) appears in the counting sequence, the larger the collection it represents (e.g., make total comparisons of “more” or “less” for two collections with one collection equaling 5, 10 or up to 50 items).</p> <p>NO1.23. Demonstrate an understanding of the relation of inequality when comparing whole numbers by using “1 more,” “1 less,” “10 more,” “10 less.”</p> <p>NO1.24. Compare whole numbers to each other or to landmark whole numbers (10, 25, and 50).</p> <p>NO1.25. Identify the larger of two written numbers.</p> <p>NO1.26. Associate the number 0 with empty sets.</p>	<p>NO1.7. Discriminate between numerals and other printed symbols.</p> <p>NO1.8. Identify/recognize numerals 1-10 (e.g., is able to point out a “five” given a choice of numerals).</p> <p>NO1.9. Communicate 1-9 numerals (e.g., write, use number cards, communication board).</p> <p>NO1.10. Use 1-9 numerals to represent the cardinal value (how many) of a collection.</p> <p>NO1.11. Appropriately label the quantity of an empty set (e.g., “0”, “none”, “nothing”).</p> <p>NO1.12. Identify a 2 digit number.</p> <p>NO1.13. Communicate 2 digit numbers</p> <p>NO1.14. Use written numbers or words up to (1-100) and beyond to represent the cardinal value of a collection.</p> <p>NO1.15. Identify a 3 digit number or beyond.</p> <p>NO1.16. Communicate 3 digit numbers or beyond.</p> <p>NO1.17. Identify the larger of two written numbers.</p> <p>Compare whole numbers</p> <p>NO1.18. Recognize or request more and less of something (e.g., identify which glass has more or less milk).</p> <p>NO1.19. Compares two quantities (up to four items) as same or more. The perceptual cue for the arrangement of objects needs to be salient (e.g., such as organizing objects by two side by side rows).</p> <p>NO1.20. Use counting to compare two quantities (up to four items) as same or more (number-identity principle).</p> <p>NO1.21. Recognize equivalent collections of two or more items despite appearances and/or arrangement (number conservation).</p> <p>NO1.22. Use larger number principle – the later a number (word or symbol) appears in the counting sequence, the larger the collection it represents (e.g., make total comparisons of “more” or “less” for two collections with one collection equaling 5, 10, 50 or up to 100 items).</p> <p>NO1.23. Demonstrate an understanding of the relation of inequality when comparing whole numbers by using “1 more,” “1 less,” “10 more,” “10 less.”</p> <p>NO1.24. Compare whole numbers to each other or to landmark whole numbers (10, 25, 50 and 100).</p> <p>NO1.25. Identify the larger of two written numbers.</p> <p>NO1.26. Associate the number 0 with empty sets.</p>
ST	MA 1, 6 1.6	MA 1, 6 1.6, 1.10	MA 1, 6 1.6, 1.10	MA 1, 6 1.6, 1.10
FR	V c, d	V c, d, X 1a	V c, d, X 1a	V c, d, X 1a

1 Understand numbers, ways of representing numbers, relationships among numbers and number systems ---- continued				
GRADE K -2		GRADE 3 - 5	GRADE 6-8	GRADE 9-12
B	Represent and Use Rational Numbers	Represents commonly used fractions ($\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$)	Represents commonly used fractions ($\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$)	Represents commonly used fractions ($\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$)
		NO2.1. Demonstrate an understanding of a whole unit (e.g., Show one whole brownie (area model)).	NO2.1. Demonstrate an understanding of a whole unit (e.g., Show one whole brownie (area model); identify 2 children sitting at the table (discrete model)).	NO2.1. Demonstrate an understanding of a whole unit (e.g., Show one whole brownie (area model); identify 2 children sitting at the table (discrete model)).
		NO2.2. Show that fractional parts are equal shares or equal-sized portions of a whole unit using area models and discrete models (e.g., shows a fair share of a cookie; folds a piece of paper into two halves).	NO2.2. Show that fractional parts are equal shares or equal-sized portions of a whole unit using area models and discrete models (e.g., shows a fair share of a cookie; folds a piece of paper into two halves; identifies two out of four children wearing a blue shirt).	NO2.2. Show that fractional parts are equal shares or equal-sized portions of a whole unit using area models and discrete models (e.g., shows a fair share of a cookie; folds a piece of paper into two halves; identifies two out of four children wearing a blue shirt).
		a. Explore fractions using manipulatives.	a. Explore fractions using manipulatives.	a. Explore fractions using manipulatives.
		NO2.3. Recognize everyday uses of fractional parts with area models using $\frac{1}{4}$, $\frac{1}{2}$ (e.g., identifies one half of an apple; using pattern blocks, identifies one trapezoid on top of a hexagon as being $\frac{1}{2}$).	NO2.3. Recognize everyday uses of fractional parts with area models and/or discrete models using $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$ (e.g., identifies one half of an apple; using pattern blocks, identifies one trapezoid on top of a hexagon as being $\frac{1}{2}$).	NO2.3. Recognize everyday uses of fractional parts with area models and/or discrete models using $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$ (e.g., identifies one half of an apple; using pattern blocks, identifies one trapezoid on top of a hexagon as being $\frac{1}{2}$).
		NO2.4. Identify the relationship between the denominator and the whole (e.g., identifies how many parts to the whole).	NO2.4. Identify the relationship between the denominator and the whole (e.g., identifies how many parts to the whole).	NO2.4. Identify the relationship between the denominator and the whole (e.g., identifies how many parts to the whole).
		NO2.5. Identify the relationship between the numerator and the whole (e.g., identifies how many parts shaded within the whole).	NO2.5. Identify the relationship between the numerator and the whole (e.g., identifies how many parts shaded within the whole).	NO2.5. Identify the relationship between the numerator and the whole (e.g., identifies how many parts shaded within the whole).
		NO2.6. Compare fractions by comparing portions with two area models (e.g., compares 2 shaded rectangles and identifies which has more shaded parts).	NO2.6. Compare fractions by comparing portions with two area models (e.g., compares 2 shaded rectangles and identifies which has more shaded parts).	NO2.6. Compare fractions by comparing portions with two area models (e.g., compares 2 shaded rectangles and identifies which has more shaded parts).
			Recognize commonly used forms of fractions, decimals, and percents	Recognize commonly used forms of fractions, decimals, and percents
			NO2.7. Recognize fractional parts with area models and/or discrete models using $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$, $\frac{2}{3}$, or $\frac{3}{4}$ (e.g., identify a rectangle that has 3 of 4 parts shaded).	NO2.7. Recognize fractional parts with area models and/or discrete models using $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$, $\frac{2}{3}$, or $\frac{3}{4}$ (e.g., identify a rectangle that has 3 of 4 parts shaded).
ST		MA 1 1.10	MA 1 1.10	MA 1 1.10
FR		V c	V c	V c
1 Understand numbers, ways of representing numbers, relationships among numbers and number systems ---- continued				

Number and Operations

Edited for MAP-A Use Only

	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
C		<p>Connect number words (orally) and quantities they represent (First see counts and recognize “how many” in a set of objects.)</p> <p>N03.1. Demonstrate that one symbol can represent the whole amount (cardinality).</p> <p>Compose or decompose numbers using known facts</p> <p>N03.2. Nonverbally demonstrates combining and separating problems.</p> <p>a. Add one item to another item.</p> <p>b. Subtract one item from two items.</p> <p>N03.3. Use representations such as concrete materials or pictures to solve addition and subtraction situation problems (joining actions, separating actions, part-part whole relationships and comparison situations).</p> <p>a. Use sums to 6 and corresponding differences.</p> <p>b. Use sums to 10 and corresponding differences.</p> <p>c. Use sums to 18 and corresponding differences.</p> <p>d. Connect correct symbols to operation (e.g., + , −).</p>	<p>Connect number words (orally) and quantities they represent (First see counts and recognize “how many” in a set of objects.)</p> <p>N03.1. Demonstrate that one symbol can represent the whole amount (cardinality).</p> <p>Compose or decompose numbers using known facts</p> <p>N03.2. Nonverbally demonstrates combining and separating problems.</p> <p>a. Add one item to another item.</p> <p>b. Subtract one item from two items.</p> <p>N03.3. Use representations such as concrete materials or pictures to solve addition and subtraction situation problems (joining actions, separating actions, part-part whole relationships and comparison situations).</p> <p>a. Use sums to 6 and corresponding differences.</p> <p>b. Use sums to 10 and corresponding differences.</p> <p>c. Use sums to 18 and corresponding differences.</p> <p>d. Connect correct symbols to operation (e.g., + , −).</p> <p>N03.4. Demonstrate composition and decomposition of numbers without direct modeling (e.g., 5 is the same as 2+3).</p> <p>N03.5. Translate addition and subtraction word problems and their solutions into a number sentence. (e.g., 8+2=10).</p> <p>N03.6. Use strategies to reason out unknown sums to 18 and their subtraction counterparts (e.g., double plus or minus, making tens, using compensation, using know facts).</p> <p>N03.7. Use a calculator to demonstrate composition and decomposition of one and two digit numbers.</p> <p>Recognize equivalent representations for the same numbers</p> <p>N03.8. Represent quantities in different ways (part-whole relations) (e.g., 14 = 7 + 7; 14 = 9 + 5 or 14 = 10 + 4).</p> <p>N03.9. Represent numbers in an expanded form (e.g., 10 + 7).</p>	<p>Connect number words (orally) and quantities they represent (First see counts and recognize “how many” in a set of objects.)</p> <p>N03.1. Demonstrate that one symbol can represent the whole amount (cardinality).</p> <p>Compose or decompose numbers using known facts</p> <p>N03.2. Nonverbally demonstrates combining and separating problems.</p> <p>a. Add one item to another item.</p> <p>b. Subtract one item from two items.</p> <p>N03.3. Use representations such as concrete materials or pictures to solve addition and subtraction situations problems (joining actions, separating actions, part-part whole relationships and comparison situations).</p> <p>a. Use sums to 6 and corresponding differences.</p> <p>b. Use sums to 10 and corresponding differences.</p> <p>c. Use sums to 18 and corresponding differences.</p> <p>d. Connect correct symbols to operation (e.g., + , −).</p> <p>N03.4. Demonstrate composition and decomposition of numbers without direct modeling (e.g., 5 is the same as 2+3).</p> <p>N03.5. Translate addition and subtraction word problems and their solutions into a number sentence. (e.g., 8+2=10).</p> <p>N03.6. Use strategies to reason out unknown sums to 18 and their subtraction counterparts (e.g., double plus or minus, making tens, using compensation, using know facts).</p> <p>N03.7. 3.7 Use a calculator to demonstrate composition and decomposition of one and two digit numbers.</p> <p>Recognize equivalent representations for the same numbers</p> <p>N03.8. Represent quantities in different ways (part-whole relations) (e.g., 14 = 7 + 7; 14 = 9 + 5 or 14 = 10 + 4).</p> <p>N03.9. Represent numbers in an expanded form (e.g., 10 + 7; 100 + 10 + 7).</p>
ST		MA 1 1.10, 3.2, 3.3	MA 1 1.10, 3.2, 3.3, 3.6	MA 1 1.10, 3.2, 3.3, 3.6
FR		V c	V c, e	V c, e

Compose and Decompose Numbers

Number and Operations

Edited for MAP-A Use Only

	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
D		Skip count by 5s and 10s	Skip count by 5s and 10s	Skip count by 5s and 10s
Classify and Describe Numeric Relationships		NO4.1. Demonstrate an understanding of grouping. NO4.2. Skip count by 5s and 10s using concrete and semi-concrete materials (e.g., using a 100's chart).	NO4.1. Demonstrate an understanding of grouping. NO4.2. Skip count by 5s and 10s using concrete and semi-concrete materials (e.g., using a 100's chart). NO4.3. Demonstrate an understanding that "10" is a special unit within the base- ten systems (Unitizing- ten represents one unit). NO4.4. Skip-count by 10s starting with a number other than a multiple of 10 (e.g., uses a 100's chart to count by 10s). Classify numbers by their characteristics (odds, evens, multiples) NO4.5. Identify odd and even numbers. NO4.6. Show multiples of a number by skip counting (e.g. skip-counting on a 100's chart).	NO4.1. Demonstrate an understanding of grouping. NO4.2. Skip count by 5s and 10s using concrete and semi-concrete materials (e.g., using a 100's chart). NO4.3. Demonstrate an understanding that "10" is a special unit within the base- ten systems (Unitizing- ten represents one unit). NO4.4. Skip-count by 10s starting with a number other than a multiple of 10 (e.g., uses a 100's chart to count by 10s). Classify numbers by their characteristics (odds, evens, multiples) NO4.5. Identify odd and even numbers. NO4.6. Show multiples of a number by skip counting (e.g. skip-counting on a 100's chart).
	ST	MA 1 1.10, 3.2, 3.3	MA 1 1.10, 3.2, 3.3, 3.6	MA 1 1.10, 3.2, 3.3, 3.6
	FR		V c	V c, e

2 Understand meanings of operations and how they relate to one another				
	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
A	Represent Operations	Represent a given situation involving addition	Represent a given situation involving addition and subtraction	Represent a given situation involving addition and subtraction
		N05.1. Nonverbally demonstrates combining problems. a. Add one set to another set.	N05.1. Nonverbally demonstrates combining problems. a. Add one set to another set. b. Subtract some items from a larger set.	N05.1. Nonverbally demonstrates combining problems. a. Add one set to another set. b. Subtract some items from a larger set.
		N05.2. Use representations such as concrete materials or pictures to solve addition situation problems (joining actions, part-part whole relationships and comparison situations). a. Use sums to 6 and corresponding differences. b. Use sums to 10 and corresponding differences. c. Use sums to 18 and corresponding differences. d. Connect correct symbols to operation (e.g., +, =).	N05.2. Use representations such as concrete materials or pictures to solve addition and subtraction situation problems (joining actions, separating actions, part-part whole relationships and comparison situations). a. Use sums to 6 and corresponding differences. b. Use sums to 10 and corresponding differences. c. Use sums to 18 and corresponding differences. d. Connect correct symbols to operation (e.g., +, −, =). N05.3. Demonstrate adding and subtracting numbers without using manipulatives. N05.4. Translate addition and subtraction situation problems and their solutions into a number sentence. (e.g., 14 + 7 = 21).	N05.2. Use representations such as concrete materials or pictures to solve addition and subtraction situation problems (joining actions, separating actions, part-part whole relationships and comparison situations). a. Use sums to 6 and corresponding differences. b. Use sums to 10 and corresponding differences. c. Use sums to 18 and corresponding differences. d. Connect correct symbols to operation (e.g., + , − , =). N05.3. Demonstrate adding and subtracting numbers without using manipulatives. N05.4. Translate addition and subtraction situation problems and their solutions into a number sentence. (e.g., 14 + 7 = 21).
			Represent a given situation involving multiplication using sets and arrays N05.5. Recognize grouping situations. N05.6. Group a small collection (e.g., makes two groups of two with concrete materials) but counts by ones. N05.7. Represent multiplication situations with arrays or sets. N05.8. Represent multiplication situations as repeated addition.	Represent a given situation involving multiplication and division using sets and arrays N05.5. Recognize grouping situations. N05.6. Group a small collection (e.g., makes two groups of two with concrete materials) but counts by ones. N05.7. Represent multiplication situations with arrays or sets. N05.8. Represent multiplication situations as repeated addition. N05.9. Represent division situations as repeated subtraction.
ST		MA 1 1.6, 1.10	MA 1 1.6, 1.10	MA 1 1.6, 1.10, 3.6
FR		V a	V a	V a

2 Understand meanings of operations and how they relate to one another ---- continued				
	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
Describe Effects of Operations			Describe the effects of adding and subtracting whole numbers as well as the relationship between the two operations	Describe the effects of adding, subtracting, multiplying and dividing whole numbers as well as the relationship between the two operations
			NO6.1. Verbally describe and demonstrates combining and separating problems. a. Add one set to another set. b. Subtract some items from a larger set. NO6.2. Use representations such as concrete materials or pictures to describe addition and subtraction situation problems (joining actions, separating actions, part-part whole relationships and comparison situations). a. Use sums to 6 and corresponding differences. b. Use sums to 10 and corresponding differences. c. Use sums to 18 and corresponding differences.	NO6.1. Verbally describe and demonstrates combining and separating problems. a. Add one set to another set. b. Subtract some items from a larger set. NO6.2. Use representations such as concrete materials or pictures to describe addition and subtraction situation problems (joining actions, separating actions, part-part whole relationships and comparison situations). a. Use sums to 6 and corresponding differences. b. Use sums to 10 and corresponding differences. c. Use sums to 18 and corresponding differences. NO6.3. Use representation such as concrete materials or pictures to describe multiplication and/or division situation problems.
ST			MA 1 3.4, 4.1	MA 1, 5 3.4, 4.1
FR			V e	V e, IX c
Apply Properties of Operations			NO7.1. Recognize $3+5=5+3$ (commutative of addition). NO7.2. Recognize that when adding 3 or more numbers it does not matter whether the first pair or the last pair is added first. $(3+5)+2=3+(5+2)$ (associative for addition).	NO7.1. Recognize $3+5=5+3$ (commutative of addition). NO7.2. Recognize that when adding 3 or more numbers it does not matter whether the first pair or the last pair is added first. $(3+5)+2=3+(5+2)$ (associative for addition).
ST			MA 5 1.6, 1.10	MA 5 1.6, 1.10
FR			IX c	IX c

3 Compute fluently and makes reasonable estimates				
	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
A	Recognize numerals	Recognize numerals	Recognize numerals	Recognize numerals
	<p>N08.1. Represent a number or quantity (e.g., tap, draw objects or tallies).</p> <p>N08.2. Discriminate between numerals and other printed symbols.</p> <p>N08.3. Identify/recognize numerals 1-10 (e.g., is able to point out a “five” given a choice of numerals).</p> <p>N08.4. Communicate 1-9 numerals (e.g., write, use number cards, communication board).</p>	<p>N08.1. Represent a number or quantity (e.g., tap, draw objects or tallies).</p> <p>N08.2. Discriminate between numerals and other printed symbols.</p> <p>N08.3. Identify/recognize numerals 1-10 (e.g., is able to point out a “five” given a choice of numerals).</p> <p>N08.4. Communicate 1-9 numerals (e.g., write, use number cards, communication board).</p> <p>N08.5. Identify a 2 digit number.</p> <p>N08.6. Communicate 2 digit numbers</p> <p>Describe or represent a mental strategy to solve a quantitative problem</p> <p>N08.9. Use concrete (cubes) materials to show one or two more or less than the original number.</p> <p>N08.10. Use semi-concrete materials (numbers’ chart, number line) to show one or two more or less than the original number (e.g., student can identify two more than the number 16 using a 100’s chart).</p> <p>N08.11. Use counting-on and counting down or up strategies to solve addition and subtraction problems.</p> <p>N08.12. Fluently know number combinations (1-10) for addition and subtraction.</p>	<p>N08.1. Represent a number or quantity (e.g., tap, draw objects or tallies).</p> <p>N08.2. Discriminate between numerals and other printed symbols.</p> <p>N08.3. Identify/recognize numerals 1-10 (e.g., is able to point out a “five” given a choice of numerals).</p> <p>N08.4. Communicate 1-9 numerals (e.g., write, use number cards, communication board).</p> <p>N08.5. Identify a 2 digit number.</p> <p>N08.6. Communicate 2 digit numbers</p> <p>N08.7. Identify a 3 digit number.</p> <p>N08.8. Communicate 3 digit numbers.</p> <p>Describe or represent a mental strategy to solve a quantitative problem</p> <p>N08.9. Use concrete (cubes) materials to show one or two more or less than the original number.</p> <p>N08.10. Use semi-concrete materials (numbers’ chart, number line) to show one or two more or less than the original number (e.g., student can identify two more than the number 56 using a 100’s chart).</p> <p>N08.11. Use counting-on and counting down or up strategies to solve addition and subtraction problems.</p> <p>N08.12. Fluently know number combinations (1-10) for addition and subtraction.</p> <p>N08.13. Use strategies to reason out unknown sums to 20 and their subtraction counterparts (e.g., double plus or minus, making tens, using compensation, using known facts).</p> <p>N08.14. Use concrete materials to show addition or subtraction with two digit multiples of ten.</p> <p>N08.15. Use semi-concrete materials to show addition or subtraction with two digit multiples of ten.</p> <p>N08.16. Use counting-on and counting down or up strategies by 10 more or less than the original number to solve addition or subtraction problems with multiples of 10.</p> <p>N08.17. Make change from \$1.00 or less.</p>	<p>N08.1. Represent a number or quantity (e.g., tap, draw objects or tallies).</p> <p>N08.2. Discriminate between numerals and other printed symbols.</p> <p>N08.3. Identify/recognize numerals 1-10 (e.g., is able to point out a “five” given a choice of numerals).</p> <p>N08.4. Communicate 1-9 numerals (e.g., write, use number cards, communication board).</p> <p>N08.5. Identify a 2 digit number.</p> <p>N08.6. Communicate 2 digit numbers</p> <p>N08.7. Identify a 3 digit number.</p> <p>N08.8. Communicate 3 digit numbers.</p> <p>Describe or represent a mental strategy to solve a quantitative problem</p> <p>N08.9. Use concrete (cubes) materials to show one or two more or less than the original number.</p> <p>N08.10. Use semi-concrete materials (hundreds’ chart, number line) to show one or two more or less than the original number(e.g., student can identify two more than the number 56 using a 100’s chart).</p> <p>N08.11. Use counting-on and counting down or up strategies to solve addition and subtraction problems.</p> <p>N08.12. Fluently know number combinations (1-10) for addition and subtraction.</p> <p>N08.13. Use strategies to reason out unknown sums to 20 and their subtraction counterparts (e.g., double plus or minus, making tens, using compensation, using known facts).</p> <p>N08.14. Use concrete materials to show addition or subtraction with two digit multiples of ten.</p> <p>N08.15. Use semi-concrete materials to show addition or subtraction with two digit multiples of ten.</p> <p>N08.16. Use counting-on and counting down or up strategies by 10 more or less than the original number to solve addition or subtraction problems with multiples of 10.</p> <p>N08.17. Make change from \$1.00 or less</p> <p>N08.18. Adds and/or subtracts two digit numbers with student identified strategy.</p>
ST	MA 1 3.4, 4.1	MA 1 3.4, 4.1	MA 1 1.6, 1.10, 3.4, 4.1	MA 1 1.6, 1.10, 3.4, 4.1
FR	V 2a	V 2a	V 2a	V 2a

3 Compute fluently and makes reasonable estimates ---- continued				
	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
B		Develop and demonstrate fluency with basic number combinations (addition and subtraction)	Develop and demonstrate fluency with basic number combinations (addition, subtraction and multiplication)	Develop and demonstrate fluency with basic number combinations (addition and subtraction, multiplication and division)
		NO9.1. Use concrete (cubes) materials to show one or two more or less than the original number.	NO9.1. Use concrete (cubes) materials to show one or two more or less than the original number.	NO9.1. Use concrete (cubes) materials to show one or two more or less than the original number.
		NO9.2. Use semi-concrete materials (numbers' chart, number line) to show one or two more or less than the original number (e.g., student can identify two more than the number 16 using a 100's chart).	NO9.2. Use semi-concrete materials (numbers' chart, number line) to show one or two more or less than the original number (e.g., student can identify two more than the number 16 using a 100's chart).	NO9.2. Use semi-concrete materials (numbers' chart, number line) to show one or two more or less than the original number (e.g., student can identify two more than the number 16 using a 100's chart).
		NO9.3. Use counting-on and counting down or up strategies to solve addition and subtraction problems.	NO9.3. Use counting-on and counting down or up strategies to solve addition and subtraction problems.	NO9.3. Use counting-on and counting down or up strategies to solve addition and subtraction problems.
Develop and Demonstrate Fluency with Basic Numbers		NO9.4. Develop fluency with basic number relationships of addition and subtraction for sum up to 10.	NO9.4. Develop fluency with basic number relationships of addition and subtraction for sum up to 10.	NO9.4. Develop fluency with basic number relationships of addition and subtraction for sum up to 10.
			NO9.5. Use strategies to reason out unknown sums to 20 and their subtraction counterparts (e.g., double plus or minus, making tens, using compensation, using known facts).	NO9.5. Use strategies to reason out unknown sums to 20 and their subtraction counterparts (e.g., double plus or minus, making tens, using compensation, using known facts).
			Multiplication	Multiplication and Division
		NO9.6. Recognize grouping situations.	NO9.6. Recognize grouping situations.	
		NO9.7. Group a small collection (e.g., makes two groups of two with concrete materials).	NO9.7. Group a small collection (e.g., makes two groups of two with concrete materials) or separate a small collection into equal groups.	
		NO9.8. Use representations such as concrete materials or pictures to represent a multiplication situation.	NO9.8. Use representations such as concrete materials or pictures to represent a multiplication or division situation.	
		NO9.9. Show multiples of a number by skip counting (e.g. skip-counting on a 100's chart).	NO9.9. Show multiples of a number by skip counting (e.g. skip-counting on a 100's chart).	
		NO9.10. Model multiplication situations with repeated addition or with an array.	NO9.10. Model multiplication or division situations with repeated addition or with an array.	
		NO9.11. Use strategies to identify multiplication combinations.	NO9.11. Use strategies to identify multiplication or division combinations.	
ST		MA 1 1.6	MA 1 1.6	MA 1 1.6
FR		V 4c	V 4c	V 4c

3 Compute fluently and makes reasonable estimates ---- continued				
	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
C		Apply strategies to compute (addition and subtraction)	Apply strategies to compute (addition and subtraction and multiplication)	Apply strategies to compute (addition and subtraction and multiplication and division)
		<p>NO10.1. Use strategies to reason out unknown sums to 20 and their subtraction counterparts (e.g., double plus or minus, making tens, using compensation, using known facts).</p> <p>NO10.2. Use concrete materials to show addition or subtraction with two digit multiples of ten.</p> <p>NO10.3. Use semi-concrete materials to show addition or subtraction with two digit multiples of ten.</p> <p>NO10.4. Use counting-on and counting down or up strategies by 10 more or less than the original number to solve addition or subtraction problems.</p> <p>NO10.5. Compute with the operations of addition and/or subtraction.</p>	<p>NO10.1. Use strategies to reason out unknown sums to 20 and their subtraction counterparts (e.g., double plus or minus, making tens, using compensation, using known facts).</p> <p>NO10.2. Use concrete materials to show addition or subtraction with two digit multiples of ten.</p> <p>NO10.3. Use semi-concrete materials to show addition or subtraction with two digit multiples of ten.</p> <p>NO10.4. Use counting-on and counting down or up strategies by 10 more or less than the original number to solve addition or subtraction problems.</p> <p>NO10.5. Compute with the operations of addition and/or subtraction.</p> <p>Multiplication</p> <p>NO10.6. Recognize grouping situations.</p> <p>NO10.7. Group a small collection (e.g., makes two groups of two with concrete materials).</p> <p>NO10.8. Use representations such as concrete materials or pictures to represent a multiplication situation.</p> <p>NO10.9. Show multiples of a number by skip counting (e.g. skip-counting on a 100’s chart).</p> <p>NO10.10. Represent multiplication situations with repeated addition or with an array.</p> <p>NO10.11. Use strategies to identify multiplication combinations.</p> <p>NO10.12. Compute with the operations of multiplication.</p>	<p>NO10.1. Use strategies to reason out unknown sums to 20 and their subtraction counterparts (e.g., double plus or minus, making tens, using compensation, using known facts).</p> <p>NO10.2. Use concrete materials to show addition or subtraction with two digit multiples of ten.</p> <p>NO10.3. Use semi-concrete materials to show addition or subtraction with two digit multiples of ten.</p> <p>NO10.4. Use counting-on and counting down or up strategies by 10 more or less than the original number to solve addition or subtraction problems.</p> <p>NO10.5. Compute with the operations of addition and/or subtraction.</p> <p>Multiplication and Division</p> <p>NO10.6. Recognize grouping situations.</p> <p>NO10.7. Group a small collection (e.g., makes two groups of two with concrete materials) or separate a small collection into equal groups.</p> <p>NO10.8. Use representations such as concrete materials or pictures to represent a multiplication or division situation.</p> <p>NO10.9. Show multiples of a number by skip counting (e.g. skip-counting on a 100’s chart).</p> <p>NO10.10. Represent multiplication or division situations with repeated addition or with an array.</p> <p>NO10.11. Use strategies to identify multiplication or division combinations.</p> <p>NO10.12. Compute with the operations of multiplication and/or division.</p>
ST		MA 5 1.6, 1.10, 3.3	MA 5 1.6, 1.10, 3.3	MA 5 1.6, 1.10, 3.3
FR		IX e	IX e	IX e

3 Compute fluently and makes reasonable estimates ---- continued				
	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
D		Estimate a solution to a problem (addition and subtraction)	Estimate a solution to a problem (addition, subtraction and multiplication)	Estimate a solution to a problem (addition, subtraction multiplication and division)
Estimate and Justify Solution		<p>NO11.1. Use comparisons to estimate size (e.g., as big as a ...).</p> <p>NO11.2. Identify more or less.</p> <p>NO11.3. Determine which given number is closer to the amount in a given set of 5, 10, or 20 (e.g., Is this number closer to 10 or 20?).</p> <p>NO11.4. Without counting, identify a reasonable quantity when estimating the amount of objects in a given set of 5 or 10.</p> <p>NO11.5. Estimate a solution to an addition or subtraction problem (e.g., Is 9 + 9 closer to 10 or 20?).</p>	<p>NO11.1. Use comparisons to estimate size (e.g., as big as a ...).</p> <p>NO11.2. Identify more or less.</p> <p>NO11.3. Determine which given number is closer to the amount in a given set of 5, 10, or 20 (e.g., Is this number closer to 10 or 20?).</p> <p>NO11.4. Without counting, identify a reasonable quantity when estimating the amount of objects in a given set of 5 or 10.</p> <p>NO11.5. Estimate a solution to an addition or subtraction problem (e.g., Is 9 + 9 closer to 10 or 20?).</p> <p>NO11.6. Estimate a solution to a multiplication problem (e.g., Two groups of nine equal 18, what would three groups of nine be closer to- 20 or 30?).</p>	<p>NO11.1. Use comparisons to estimate size (e.g., as big as a ...).</p> <p>NO11.2. Identify more or less.</p> <p>NO11.3. Determine which given number is closer to the amount in a given set of 5, 10, or 20 (e.g., Is this number closer to 10 or 20?).</p> <p>NO11.4. Without counting, identify a reasonable quantity when estimating the amount of objects in a given set of 5 or 10.</p> <p>NO11.5. Estimate a solution to an addition or subtraction problem (e.g., Is 9 + 9 closer to 10 or 20?).</p> <p>NO11.6. Estimate a solution to a multiplication and/or division problem (e.g., Two groups of nine equal 18, what would three groups of nine be closer to- 20 or 30?).</p>
ST		MA 1 3.3, 3.4	MA 1 3.3, 3.4	MA 1 3.3, 3.4
FR		V 2a	V 2a	V 2a
F				Use equivalent ratios in real life situations
Use Proportional Reasoning				<p>NO12.1. Recognize real life ratio situations with discrete models (e.g., one adult teacher for every three students; one sandwich to be shared with two people).</p> <p>NO12.2. Show proportion using a real life situations (e.g., one candy bar cost \$0.50, what does two candy bars cost).</p>
ST				MA 1 3.3
FR				V c

1 Understand patterns, relations and functions				
	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
A	Recognize patterns of sounds or shapes.	Repeat patterns of sounds or shapes.	Repeat patterns of sounds or shapes. Extend patterns of sounds, shapes and simple numeric patterns.	Repeat patterns of sounds or shapes. Extend patterns of sounds, shapes and simple numeric patterns. Describe patterns of sounds, shapes and simple numeric patterns.
	AR1.1. Recognize and extend a variety of patterns. a. Engage in pattern-related activities in the everyday environment (e.g., sound, movement, visual). b. Recognize the pattern of a pattern-related activity (e.g., simple singing pattern, boy-girl pattern, stand-sit pattern). c. Explore simple repeating patterns with concrete materials (e.g., making “trains” or “towers” with two colors of snap cubes). d. Recognize a simple repeating (A, B) pattern with concrete materials (e.g., blue-red, blue red cubes).	AR1.1. Recognize and extend a variety of patterns. a. Engage in pattern-related activities in the everyday environment (e.g., sound, movement, visual). b. Recognize the pattern of a pattern-related activity (e.g., simple singing pattern, boy-girl pattern, stand-sit pattern, calendar). c. Explore simple repeating patterns with concrete materials (e.g., making “trains” or “towers” with two colors of snap cubes). d. Recognize a simple repeating (A, B) pattern with concrete materials (e.g., blue-red, blue red cubes). e. Reproduce (by matching or being shown) a simple repeating pattern. f. Explore growing patterns both with geometric elements such as a growing train of blocks and/or counting sequence.	AR1.1. Recognize and extend a variety of patterns. a. Engage in pattern-related activities in the everyday environment (e.g., sound, movement, visual). b. Recognize the pattern of a pattern-related activity (e.g., simple singing pattern, boy-girl pattern, stand-sit pattern, calendar). c. Explore simple repeating patterns with concrete materials (e.g., making “trains” or “towers” with two colors of snap cubes). d. Recognize a simple repeating (A, B) and (A, B, C) patterns with concrete materials (e.g., blue-red, blue red cubes). e. Reproduce (by matching or being shown) a simple repeating pattern. f. Explore growing patterns both with geometric elements such as a growing train of blocks and/or counting sequence. g. Extend a repeating pattern of sound, shapes and numbers (e.g., do, re, mi, do, re, mi,...; circle, square, triangle, circle,...; 1, 2, 3, 1, 2, 3,). h. Explain extension of a repeating pattern. i. Recognize a growing pattern (e.g., counting sequence pattern; such as skip-counting by ones or tens). j. Extend a simple growing pattern (e.g., counting by ones or twos).	AR1.1. Recognize and extend a variety of patterns. a. Engage in pattern-related activities in the everyday environment (e.g., sound, movement, visual). b. Recognize the pattern of a pattern-related activity (e.g., simple singing pattern, boy-girl pattern, stand-sit pattern, calendar). c. Explore simple repeating patterns with concrete materials (e.g., making “trains” or “towers” with two colors of snap cubes). d. Recognize a simple repeating (A, B) and (A, B, C) patterns with concrete materials (e.g., blue-red, blue red cubes). e. Reproduce (by matching or being shown) a simple repeating pattern. f. Explore growing patterns both with geometric elements such as a growing train of blocks and/or counting sequence. g. Extend a repeating pattern of sound, shapes and numbers (e.g., do, re, mi, do, re, mi,...; circle, square, triangle, circle,...; 1, 2, 3, 1, 2, 3,). h. Explain extension of a repeating pattern. i. Recognize a growing geometric pattern with tables, charts or graphs (e.g., recognizing a growing “staircase” on graph paper or recognizing outcomes in a table). j. Recognize a growing numeric pattern with tables, charts or graphs (e.g., counting sequence pattern; such as skip-counting on a hundreds chart; or recognizing outcomes in a table). k. Extend a simple growing pattern (e.g., counting by ones or twos or other numbers that reflect multiplication facts). l. Recognize two patterns as being the same, such as “blue, blue, red, blue, blue, red” is the same as “clap, clap, step, clap, clap, step.” Both have the AABAAB form..
ST	MA 4 1.6	MA 4 1.6	MA 4 1.6	MA 4 1.6
FR	VIII.a	VIII.a	VIII.a	VIII.a

1 Understand patterns, relations and functions ---- continued				
	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
B	Create patterns.	Continue patterns.	Continue patterns. Describe how simple repeating patterns are generated.	Continue patterns. Describe how simple growing patterns are generated. Represent patterns using words, tables or graphs.
Create and Analyze Patterns	AR2.1. Create patterns. a. Create a simple repeating pattern with concrete materials.	AR2.1. Create patterns. a. Create a simple repeating pattern with concrete materials. b. Create a simple growing pattern with concrete or semi-concrete representation.	AR2.1. Create patterns. a. Create a simple repeating pattern with concrete materials or semi-concrete representation. b. Create a simple growing pattern with concrete or semi-concrete representation. AR2.2. Analyze patterns. a. Describe a simple repeating pattern. b. Predict “what comes next” for a repeating pattern. c. Identify the core unit of a repeating pattern (e.g., circle, square repeats).	AR2.1. Create patterns. 1.2a Create a simple repeating pattern with concrete materials or semi-concrete representation. 1.2b Create a simple growing pattern with concrete or semi-concrete representation. 1.2c Represent patterns with tables, charts or graphs (e.g., shade a 100’s chart to represent a pattern). AR2.2. Analyze patterns. a. Describe a simple repeating pattern. b. Predict “what comes next” for a repeating pattern . c. Identify the core unit of a repeating pattern and growing pattern (e.g., circle, square repeats; ABAABAAAB). d. Literally describes a growing pattern (e.g., the staircase get “bigger”). e. Predict “what comes next” for a growing pattern. f. Describe the change between successive elements in a pattern that grows at a constant rate (e.g., Δ ΔΔ ΔΔΔ ΔΔΔΔ, each successive elements grows by one triangle).
ST		MA 4 1.6, 3.5	MA 4 1.6, 3.5	MA 4 1.6, 3.5, 3.6
FR		VIII.a	VIII.a	VIII 3a
C	b.	Sort objects by attributes.	Classify objects by attributes.	Classify objects by attributes.
Classify Objects and Representations		AR3.1. Sort, classify and order objects. a. Given a class of objects, engage with informal sorting experiences (e.g., help to put away groceries; sort blocks by the child’s chosen attribute, etc.). b. Engage in sorting activities that focus with identified attributes of objects (e.g., sorting by color). c. Sort objects into groups having similar traits such as size, color or design (e.g., sort pattern blocks by color and shape).	AR3.1. Sort, classify and order objects. a. Given a class of objects, engage with informal sorting experiences (e.g., help to put away groceries; sort blocks by the child’s chosen attribute, etc.). b. Engage in sorting activities that focus with identified attributes of objects (e.g., sorting by color). c. Sort objects into groups having similar traits such as size, color or design (e.g., sort pattern blocks by color and shape). d. Classify objects (sort into a systematic arrangement of groups according to established criteria).	AR3.1. Sort, classify and order objects. a. Given a class of objects, engage with informal sorting experiences (e.g., help to put away groceries; sort blocks by the child’s chosen attribute, etc.). b. Engage in sorting activities that focus with identified attributes of objects (e.g., sorting by color). c. Sort objects into groups having similar traits such as size, color or design (e.g., sort pattern blocks by color and shape). d. Classify objects (sort into a systematic arrangement of groups according to established criteria).
ST		MA 2 1.8	MA 2 1.8	MA 2,6 1.8
FR		VI.a	VI.a	VI.a, X.c

2 Represent and analyze mathematical situations and structures using algebraic symbols				
	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
A			Represent a mathematical situation as an <u>expression</u> or number sentence.	Represent a mathematical situation as an <u>expression</u> or number sentence.
Represent Mathematical Situations			AR4.1. Represent mathematical situations. a. Use objects, pictures, words, or numbers to represent a mathematical situation. b. Describe and represent quantities in different ways (e.g., $10=4+6$ or $4+6=5+5$). c. Recognize equivalent representations (e.g., $4+6=5+5$).	AR4.1. Represent mathematical situations. a. Use objects, pictures, words, or numbers to represent a mathematical situation. b. Describe and represent quantities in different ways (e.g., $10=4+6$ or $4+6=5+5$). c. Recognize equivalent representations (e.g., $4+6=5+5$). d. Represent a mathematical situation with a number sentence. e. Recognize a box, letter or other symbol as a place holder. f. Find missing addends represented in a number sentence.
ST			MA 4 1.6,3.1	MA 4 1.6,3.1
FR		VIII.a	VIII.2.b	VIII.2.b
B			Apply the commutative and associative property.	Apply the commutative and associative property.
Describe and Use Mathematical Manipulations			AR5.1. Recognize $3+5=5+3$ (commutative of addition). AR5.2. Recognize that when adding 3 or more numbers it does not matter whether the first pair or the last pair is added first. $(3+5)+2=3+(5+2)$ (associative for addition).	AR5.1. Recognize $3+5=5+3$ (commutative of addition). AR5.2. Recognize that when adding 3 or more numbers it does not matter whether the first pair or the last pair is added first. $(3+5)+2=3+(5+2)$ (associative for addition).
ST			MA 5 1.6, 1.10	MA 5 1.6, 1.10
FR			IX c	IX c

3 Use mathematical models to represent and understand quantitative relationships				
	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
A	<u>Model</u> situations that involve whole numbers, using pictures, objects or symbols.	<u>Model</u> situations that involve addition and subtraction of whole numbers, using pictures, objects or symbols.	<u>Model</u> situations that involve addition, subtraction and/or multiplication of whole numbers, using pictures, objects or symbols.	<u>Model</u> situations that involve addition, subtraction and/or multiplication of whole numbers, using pictures, objects or symbols.
Use Mathematical Models	AR6.1. Use models to represent quantitative relationships. a. Use pictures, objects or symbols to enact stories or model situations involving whole numbers.	AR6.1. Use models to represent quantitative relationships. a. Use pictures, objects or symbols to enact stories or model situations involving whole numbers. b. Use pictures, objects or symbols to enact stories or model situations involving addition and subtraction of whole numbers.	AR6.1. Use models to represent quantitative relationships. a. Use pictures, objects or symbols to enact stories or model situations involving whole numbers. b. Use pictures, objects or symbols to enact stories or model situations involving addition, subtraction and/or multiplication of whole numbers.	AR6.1. Use models to represent quantitative relationships. a. Use pictures, objects or symbols to enact stories or model situations involving whole numbers. b. Use pictures, objects or symbols to enact stories or model situations involving addition, subtraction and/or multiplication of whole numbers.
ST	MA 4 1.6,3.6	MA 4 1.6,3.6	MA 4 1.6,3.6	MA 4 1.6,3.6
FR	VIII.I	VIII.I	VIII.I	VIII.I

4 Analyze change in various contexts				
	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
A		Describe <u>qualitative</u> change, such as students growing taller.	Describe <u>qualitative</u> change, such as students growing taller.	Describe quantitative change, such as students growing two inches in a year .
Analyze Change		AR7.1. Analyze change in a variety of situations. a. Recognize change in the environment (e.g., taller, colder, darker, or heavier). b. Engage in activities to keep track of change (e.g., keeping track of outside temperature). c. Describe change in qualitative terms (e.g., identifying something as taller, colder, darker or heavier).	AR7.1. Analyze change in a variety of situations. a. Recognize change in the environment (e.g., taller, colder, darker, or heavier). b. Engage in activities to keep track of change (e.g., keeping track of outside temperature). c. Describe change in qualitative terms (e.g., identifying something as taller, colder, darker or heavier). d. Identify some changes are predictable and others are not.	AR7.1. Analyze change in a variety of situations. a. Recognize change in the environment (e.g., taller, colder, darker, or heavier). b. Engage in activities to keep track of change (e.g., keeping track of outside temperature). c. Describe change in qualitative terms (e.g., identifying something as taller, colder, darker or heavier; identify the numerical change). d. Identify some changes are predictable and others are not.
ST		MA 4 4.1	MA 4 4.1	MA 4 4.1
FR		VIII.b	VIII.b	VIII.b

1 Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments				
	GRADE K - 2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
<div>Describe and Use Geometric Relationships</div>	<div> <div>A</div> <div>Sort 2- and 3-dimensional shapes using physical models (circle, rectangle, triangle, sphere, rectangular prism, cylinder, pyramid).</div> <div> <div>GS1.1.</div> <div>Identify, name, compare and/or sort 2-D shapes.</div> <div> <div>a.</div> <div>Use 2-D shapes (e.g., pattern blocks) for informal play.</div> </div> <div> <div>b.</div> <div>Match shapes with another same size shape (e.g., match two same size shapes that are squares).</div> </div> <div> <div>c.</div> <div>Match shapes with another different size shape (e.g., match two different size squares).</div> </div> </div> <div> <div>GS1.2.</div> <div>Describe, draw and represent 2-D shapes.</div> <div> <div>a.</div> <div>Draw a 2-D shape with some accuracy.</div> </div> <div> <div>b.</div> <div>Describe a 2-D shape informally.</div> </div> </div> <div> <div>GS1.3.</div> <div>Name, describe, compare, and/or sort 3-D concrete objects.</div> <div> <div>a.</div> <div>Use 3-D solids (e.g., geo- blocks, prisms, pyramids) for informal play.</div> </div> </div> </div>	<div> <div>Recognize 2- and 3-dimensional shapes using physical models (circle, triangle, trapezoid, rectangle, rhombus, sphere, rectangular prism, cylinder, prism).</div> <div> <div>GS1.1.</div> <div>Identify, name, compare, classify and/or sort 2-D shapes.</div> <div> <div>a.</div> <div>Use 2-D shapes (e.g., pattern blocks) for informal play.</div> </div> <div> <div>b.</div> <div>Match shapes with another same size shape (e.g., match two same size shapes that are rectangles).</div> </div> <div> <div>c.</div> <div>Match shapes with another different size shape and orientation (e.g., match two different size rectangles).</div> </div> <div> <div>d.</div> <div>Match and compare shapes and the parts of shapes to justify congruency.</div> </div> </div> <div> <div>GS1.2.</div> <div>Describe, draw and represent 2-D shapes.</div> <div> <div>a.</div> <div>Draw a 2-D shape with some accuracy.</div> </div> <div> <div>b.</div> <div>Describe a 2-D shape informally.</div> </div> </div> <div> <div>GS1.3.</div> <div>Name, describe, compare, and/or sort 3-D concrete objects.</div> <div> <div>a.</div> <div>Use 3-D solids (e.g., geo- blocks, prisms, pyramids) for informal play.</div> </div> <div> <div>b.</div> <div>Informally describe, compare and/or sort 3-D concrete objects (e.g., Identifying a cone to look like an ice-cream cone. Pointing out a sphere rolls like a ball).</div> </div> </div> </div>	<div> <div>Recognize 2- and 3-dimensional shapes using physical models (circle, triangle, trapezoid, rectangle, rhombus, sphere, rectangular prism, cylinder, prism).</div> <div> <div>GS1.1.</div> <div>Identify, name, compare, classify and/or sort2-D shapes.</div> <div> <div>a.</div> <div>Use 2-D shapes (e.g., pattern blocks) for informal play.</div> </div> <div> <div>b.</div> <div>Match shapes with another same size shape (e.g., match two same size shapes that are rectangles).</div> </div> <div> <div>c.</div> <div>Match shapes with another different size shape and orientation (e.g., match two different size rectangles).</div> </div> <div> <div>d.</div> <div>Match and compare shapes and the parts of shapes to justify congruency.</div> </div> <div> <div>e.</div> <div>Recognize and name some variations of the circle, square, triangle, rectangle.</div> </div> <div> <div>f.</div> <div>Recognize and name circle, square, triangle, rectangle in any size or orientation (varying shapes for triangles and rectangles).</div> </div> <div> <div>g.</div> <div>Use shape class names (rectangle, triangles) to classify and sort.</div> </div> </div> <div> <div>GS1.2.</div> <div>Describe, draw and represent 2-D shapes.</div> <div> <div>a.</div> <div>Draw a 2-D shape with accuracy.</div> </div> <div> <div>b.</div> <div>Describe attributes of 2-D shapes.</div> </div> </div> <div> <div>GS1.3.</div> <div>Name, describe, compare, and/or sort 3-D concrete objects.</div> <div> <div>a.</div> <div>Use 3-D solids (e.g., geo- blocks, prisms, pyramids) for informal play.</div> </div> <div> <div>b.</div> <div>Informally describe, compare and/or sort 3-D concrete objects (e.g., Identifying a cone to look like an ice-cream cone. Pointing out a sphere rolls like a ball).</div> </div> <div> <div>c.</div> <div>Name, describe, compare and/or sort 3-D concrete objects (e.g., sort all pyramids in one group. Describe a cube by counting the number of faces).</div> </div> </div> </div>	<div> <div>Recognize 2- and 3-dimensional shapes using physical models (circle, triangle, trapezoid, rectangle, rhombus, sphere, rectangular prism, cylinder, prism).</div> <div> <div>GS1.1.</div> <div>Identify, name, compare, classify and/or sort2-D shapes.</div> <div> <div>a.</div> <div>Use 2-D shapes (e.g., pattern blocks) for informal play.</div> </div> <div> <div>b.</div> <div>Match shapes with another same size shape (e.g., match two same size shapes that are rectangles).</div> </div> <div> <div>c.</div> <div>Match shapes with another different size shape and orientation (e.g., match two different size rectangles).</div> </div> <div> <div>d.</div> <div>Match and compare shapes and the parts of shapes to justify congruency.</div> </div> <div> <div>e.</div> <div>Recognize and name some variations of the circle, square, triangle, rectangle.</div> </div> <div> <div>f.</div> <div>Recognize and name circle, square, triangle, rectangle in any size or orientation (varying shapes for triangles and rectangles).</div> </div> <div> <div>g.</div> <div>Use shape class names (rectangle, triangles) to classify and sort.</div> </div> <div> <div>h.</div> <div>Recognize and name a variety of shapes (e.g., semicircles, quadrilaterals, trapezoids, rhombi, hexagons, in any orientation).</div> </div> <div> <div>i.</div> <div>Use class membership for shapes, based on properties (e.g., four sided shapes are quadrilaterals).</div> </div> </div> <div> <div>GS1.2.</div> <div>Describe, draw and represent 2-D shapes.</div> <div> <div>a.</div> <div>Draw a 2-D shape with accuracy.</div> </div> <div> <div>b.</div> <div>Describe attributes of 2-D shapes.</div> </div> <div> <div>c.</div> <div>Represent a 2-D shape by its attributes.</div> </div> </div> <div> <div>GS1.3.</div> <div>Name, describe, compare, and/or sort 3-D concrete objects.</div> <div> <div>a.</div> <div>Use 3-D solids (e.g., geo- blocks, prisms, pyramids) for informal play.</div> </div> <div> <div>b.</div> <div>Informally describe, compare and/or sort 3-D concrete objects (e.g., Identifying a cone to look like an ice-cream cone. Pointing out a sphere rolls like a ball).</div> </div> <div> <div>c.</div> <div>Name, describe, compare and/or sort 3-D concrete objects using their attributes (bases, faces, vertexes) (e.g., sort all prisms in one group. Identify and describe a faces of a prism as specific 2-D shapes).</div> </div> </div> </div>
	ST	MA 2 1.6	MA 2 1.6	MA 2 1.6
	FR	VI 2	VI 2	VI 2a

1 Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments ---- continued				
	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
C	<p>GS2.1. Compose (put together) 2-D shapes to make new shapes.</p> <p>a. Use shapes in isolation (concrete or semi-concrete) to make a picture (e.g., use pattern blocks or paper pattern blocks to make a picture).</p> <p>b. Use shapes (concrete or semi-concrete) by combining the shapes to make a picture or design.</p> <p>c. Use shapes to cover an outline by trial and error (e.g., use pattern blocks to cover a pattern block puzzle shape).</p> <p>GS2.2. Compose 3 dimensional shapes using physical models.</p> <p>a. Use 3-D solids (e.g., geo- blocks, prisms, pyramids) for informal play.</p>	<p>GS2.1. Compose (put together) 2-D shapes to make new shapes.</p> <p>a. Use shapes in isolation (concrete or semi-concrete) to make a picture (e.g., use pattern blocks or paper pattern blocks to make a picture).</p> <p>b. Use shapes (concrete or semi-concrete) by combining the shapes to make a picture or design.</p> <p>c. Use shapes to cover an outline by trial and error (e.g., use pattern blocks to cover a pattern block puzzle shape).</p> <p>d. Compose and combine shapes into a new shape (e.g., use two trapezoids to make a hexagon).</p> <p>GS2.2. Compose 3 dimensional shapes using physical models.</p> <p>a. Use 3-D solids (e.g., geo- blocks, prisms, pyramids) for informal play.</p> <p>b. Use geo-solids to compose 3 dimensional shapes.</p>	<p>GS2.1. Compose (put together) and decompose 2-D shapes to make new shapes.</p> <p>a. Use shapes in isolation (concrete or semi-concrete) to make a picture (e.g., use pattern blocks or paper pattern blocks to make a picture).</p> <p>b. Use shapes (concrete or semi-concrete) by combining the shapes to make a picture or design.</p> <p>c. Use shapes to cover an outline first by trial and error and then with foresight (e.g., use pattern blocks to cover a pattern block puzzle shape).</p> <p>d. Compose and combine shapes into a new shape (e.g., use two trapezoids to make a hexagon).</p> <p>e. Substituting a new combination of smaller shapes for a larger shape (e.g., Substitute or trade 3 triangle pattern blocks for a trapezoid in a pattern block puzzle).</p> <p>f. Decompose simple shapes that have obvious clues for breaking them apart.</p> <p>g. Predict the results of putting together shapes.</p> <p>GS2.2. Compose 3 dimensional shapes using physical models.</p> <p>a. Use 3-D solids (e.g., geo- blocks, prisms, pyramids) for informal play.</p> <p>b. Use geo-solid to compose 3 dimensional shapes.</p> <p>c. Predict the results of putting together 3-dimensional shapes (geo-blocks).</p> <p>d. Use nets to make 3 dimensional shapes (e.g., a cube or rectangular prism).</p>	<p>GS2.1. Compose (put together) and decompose 2-D shapes to make new shapes.</p> <p>a. Use shapes in isolation (concrete or semi-concrete) to make a picture (e.g., use pattern blocks or paper pattern blocks to make a picture).</p> <p>b. Use shapes (concrete or semi-concrete) by combining the shapes to make a picture or design.</p> <p>c. Use shapes to cover an outline first by trial and error and then with foresight (e.g., use pattern blocks to cover a pattern block puzzle shape).</p> <p>d. Compose and combine shapes into a new shape (e.g., use two trapezoids to make a hexagon).</p> <p>e. Substituting a new combination of smaller shapes for a larger shape (e.g., Substitute or trade 3 triangle pattern blocks for a trapezoid in a pattern block puzzle)</p> <p>f. Decompose simple shapes that have obvious clues for breaking them apart.</p> <p>g. Predict the results of putting together or taking apart shapes.</p> <p>GS2.2. Compose 3 dimensional shapes using physical models.</p> <p>a. Use 3-D solids (e.g., geo- blocks, prisms, pyramids) for informal play.</p> <p>b. Use geo-solids to compose 3 dimensional shapes.</p> <p>c. Predict the results of putting together 3dimensional shapes (geo-blocks).</p> <p>d. Use nets to make 3 dimensional shapes (e.g., a cube or rectangular prism).</p> <p>e. Build 3 dimensional shapes using their attributes (bases, faces, vertexes) (e.g., build a cube with straws by knowing the number of faces and vertexes).</p>
	ST MA 2 1.6	MA 2 1.6	MA 2 1.6,1.10	MA 2 1.6,1.10
	FR VI.2	VI.2	VI.2.a	VI.2.a

2 Specify locations and describe spatial relationships using coordinate geometry and other representational systems				
	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
A		Recognize or demonstrate relative positions in space (above, below, front, behind).	Identify location using common language geometric vocabulary (forward, back, above, below).	Recognize or demonstrate relative positions in space (left, right) and find locations on a simple map.
		GS3.1. Recognize or demonstrate relative positions in space. a. Use everyday positional descriptions such as over, under, near, far, between, left, right, above, below, on, beside, next to, to recognize relative positions of objects in space. b. Use directions with positional descriptions to identify location of objects in space.	GS3.1. Recognize or demonstrate relative positions in space. a. Use everyday positional descriptions such as over, under, near, far, between, left, right, above, below, on, beside, next to, to recognize relative positions of objects in space. b. Use directions with positional descriptions to identify location of objects in space.	GS3.1. Recognize or demonstrate relative positions in space. a. Use everyday positional descriptions such as over, under, near, far, between, left, right, above, below, on, beside, next to, to recognize relative positions of objects in space. b. Use directions with positional descriptions to identify location of objects in space.
		GS3.2. Use and create simple maps. a. Accurately move along a path that replicates a route (e.g., move from their desk to the teacher's desk).	GS3.2. Use and create simple maps. a. Accurately move along a path that replicates a route (e.g., move from their desk to the teacher's desk). b. Use navigation ideas, such as left, right, forward, backward to move along a path. c. Draw a simple sketch map of familiar area (e.g., draw a sketch of the playground). d. Use a simple grid with x-axis label with letters and y-axis labeled with numbers to locate objects in regions.	GS3.2. Use and create simple maps. a. Accurately move along a path that replicates a route (e.g., move from their desk to the teacher's desk). b. Use navigation ideas, such as left, right, forward, backward to move along a path. c. Draw a simple sketch map of familiar area (e.g., draw a sketch of the playground). d. Use a simple grid with x-axis label with letters and y-axis labeled with numbers to locate objects in regions.
				GS3.3. Use a coordinate reference system. a. Use a simple 3 by 3 grid to play Three in a Row or Tic-Tac-Toe (e.g., first putting marks in spaces and then on intersections). b. Use a simple grid (3 by 3 or 4 by 4) with x-axis label with letters and y-axis labeled with numbers to locate objects at intersections using positional language (e.g., move right 3 and up 2). c. Use a simple grid with x-axis label with letters and y-axis labeled with numbers to describe path to an object or point using positional language (e.g., move right 3 and up 2). d. Use coordinate labels to locate objects or pictures in simple situations (e.g., "Which picture is located at (B, 3)?").
ST		MA 2 3.3,4.1	MA 2 3.3,4.1	MA 2 3.3,4.1
FR		VI.4.i	VI.4.i	VI.4.i

3 Apply transformations and use symmetry to analyze mathematical situations				
	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
A	Use Transformations on Objects	Use manipulatives in spatial relations problem solving.	Demonstrate spatial relationships in problem solving (slide, flip, turn). Predict results of use of slide/turn for problem solving.	Demonstrate spatial relationships in problem solving (slide, flip, turn). Predict results of use of slide/turn for problem solving. Describe outcome of spatial relationships.
		GS4.1. Perform slides, flips and turns of 2-D shapes. a. Move shapes informally to compare their parts and size (e.g., Place one pattern block on top of another to compare). b. Move shapes informally to fill a pattern block puzzle or simple puzzle.	GS4.1. Perform slides, flips and turns of 2-D shapes. a. Move shapes informally to compare their parts and size (e.g., Place one pattern block on top of another to compare). b. Move shapes informally to fill a pattern block puzzle or simple puzzle. c. Verify congruence (two shapes are “the same”) for some tasks through trial and error. d. Use simple tasks and orientation clues with manipulatives to demonstrate transformations (e.g., Research states, depending on the task, slides are the easiest motions for students then flips and turns). e. Use computer tools to demonstrate transformations. GS4.2. Predict outcomes of transformations on 2-D shapes. a. Mentally transform shapes to identify the results of a transformation.	GS4.1. Perform slides, flips and turns of 2-D shapes. a. Move shapes informally to compare their parts and size (e.g., Place one pattern block on top of another to compare). b. Move shapes informally to fill a pattern block puzzle or simple puzzle. c. Verify congruence with accuracy (two shapes are “the same”) for some tasks. d. Use simple tasks and orientation clues with manipulatives to demonstrate transformations (e.g., Research states, depending on the task, slides are the easiest motions for students then flips and turns). e. Use computer tools to demonstrate transformations. GS4.2. Predict outcomes of transformations on 2-D shapes. a. Mentally transform shapes to identify the results of a transformation. b. Mentally transform shapes and describe the transformation.
ST		MA 2 1.4	MA 2 1.4	MA 2 1.4, 4.1
FR		VI	VI	VI
C	Use Symmetry	Recognize shapes that have symmetry.	Recognize shapes that have symmetry. Create shapes that have symmetry. Identify objects that have symmetry.	Recognize shapes that have symmetry. Create shapes that have symmetry. Identify objects that have symmetry.
		GS5.1. Recognize, create and/or identify symmetry. a. Informally create 2-D shapes and/or 3-D buildings that have line symmetry.	GS5.1. Recognize, create and/or identify symmetry. a. Informally create 2-D shapes and/or 3-D buildings that have line and rotational symmetry. b. Identify and/or create shapes that have line or rotational symmetry. c. Identify 3-D shapes that have line symmetry.	GS5.1. Recognize, create and/or identify symmetry. a. Informally create 2-D shapes and/or 3-D buildings that have line and rotational symmetry. b. Identify and/or create shapes that have line or rotational symmetry. c. Identify 3-D shapes that have line symmetry. d. Identify the mirror line of shapes with lines of symmetry.
ST		MA 2 1.10	MA 2 1.10	MA 2 1.10
FR		VI.f	VI.f	VI.f

4 Use visualization, spatial reasoning and geometric modeling to solve problems				
	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
A Recognize and Draw Three-Dimensional Representations		Recognize geometric shapes in the student's environment (stop sign, number cube, ball). GS6.1. Observe, explore, recognize, and/or draw 3-D geometric shapes and structures in the environment. a. Observe and explore geometric solids. b. Informally recognize and compare objects in the student's environment to geometric solids (e.g., a sphere is round like a ball).	Recognize geometric shapes and structures in the student's environment and specify the shape's location. GS6.1. Observe, explore, recognize, and/or draw 3-D geometric shapes and structures in the environment. a. Observe and explore geometric solids. b. Informally recognize and compare objects in the student's environment to geometric solids (e.g., a sphere is round like a ball). c. Use geo-solids such as geo-blocks to construct. d. Draw 3-D shapes with some accuracy. e. Recognize and compare 3-D shapes to structures in the environment and identify their location. f. Engage in activities to see shapes from different perspectives.	Recognize and represent shapes from different perspectives. GS6.1. Observe, explore, recognize, and/or draw 3-D geometric shapes and structures in the environment. a. Observe and explore geometric solids. b. Informally recognize and compare objects in the student's environment to geometric solids (e.g., a sphere is round like a ball). c. Use geo-solids such as geo-blocks to construct. d. Draw 3-D shapes with some accuracy. e. Recognize and compare 3-D shapes to structures in the environment and identify their location. f. Engage in activities to see shapes from different perspectives. g. Identify the different perspectives (views) (e.g., front, back, top, bottom) of the 3-D shape or structure.
	ST	MA 2 3.3	MA 2 3.3	MA 2 3.3, 3.6
	FR	VI.3.e	VI.3 & 4.e & f	VI.3 & 4.e & f

1 Formulate questions that can be addressed with data and collect, organize and display relevant data to answer them				
	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
A	Formulate Questions	Pose questions and gather data about themselves and their surroundings.	Develop procedures to address a given question.	Collect data using observations, surveys and experiments.
		DP1.1. Formulate questions that can be addressed with data collection. <ul style="list-style-type: none"> a. Identify what information is interesting to know (e.g., favorite TV show, ice cream; number of pets, teeth lost). b. Pose a question to answer/find information (e.g., "How many pets do you have?"). DP1.2. Collect data. <ul style="list-style-type: none"> a. Attend to another person collecting and recording data. b. Indicate an awareness of collections within the environment. 	DP1.1. Formulate questions that can be addressed with data collection. <ul style="list-style-type: none"> a. Identify what information would be interesting to know (e.g., favorite TV show, ice cream; number of pets, teeth lost). b. Pose question to answer interest to know (e.g., "How many pets do you have?"). DP1.2. Collect data. <ul style="list-style-type: none"> a. Attend to another person collecting and recording data. b. Indicate an awareness of collections within the environment. c. When given a problem or situation, determine the data that must be collected. d. Identify where and how to collect the data (e.g., ask classmates; use counts and tallies). e. Identify how much data to collect. 	DP1.1. Formulate questions that can be addressed with data collection. <ul style="list-style-type: none"> a. Identify what information would be interesting to know (e.g., favorite TV show, ice cream; number of pets, teeth lost). b. Pose question to answer interest to know (e.g., "How many pets do you have?"). c. When given a problem or situation, determine the question or questions needed to acquire the data. d. Identify questions to be used for a survey. DP1.2. Collect data. <ul style="list-style-type: none"> a. Attend to another person collecting and recording data. b. Identify where and how to collect the data (e.g., ask classmates; use counts and tallies). c. Indicate an awareness of collections within the environment. d. When given a problem or situation, determine the data that must be collected. e. Identify where and how to collect the data (e.g., ask classmates; use counts and tallies). f. Identify how much data to collect. g. Collect data by observing. h. Collect data from an experiment.
ST		MA 3 1.2	MA 3 1.2	MA 3 1.2
FR		VII.1.a	VII.1.a	VII.1.a
B	Classify and Organize Data	Sort items according to their <u>attributes</u> .	Sort and classify items according to their <u>attributes</u> .	Sort and classify items according to their <u>attributes</u>
		DP2.1. Make decisions on how to classify data. <ul style="list-style-type: none"> a. Given a class of objects, engage with informal sorting experiences (e.g., help to put away groceries; sort blocks by the child's chosen attribute, etc.). b. Engage in sorting activities that focus with identified attributes of objects (e.g., sorting by color). 	DP2.1. Make decisions on how to classify data. <ul style="list-style-type: none"> a. Given a class of objects, engage with informal sorting experiences (e.g., help to put away groceries; sort blocks by the child's chosen attribute, etc.). b. Engage in sorting activities that focus with identified attributes of objects (e.g., sorting by color; play sorting games). 	DP2.1. Make decisions on how to classify data. <ul style="list-style-type: none"> a. Given a class of objects, engage with informal sorting experiences (e.g., help to put away groceries; sort blocks by the child's chosen attribute, etc.). b. Engage in sorting activities that focus with identified attributes of objects (e.g., sorting by color; play sorting games). c. Sort data into general and subcategories to solve the problem or situation (e.g., how many students have brown eyes, how many girls have brown eyes, etc.).
ST		MA 2 1.8	MA 2 1.8	MA 2,3 1.8
FR		VI.a	VI.a	VI.a,VII.3

1 Formulate questions that can be addressed with data and collect, organize and display relevant data to answer them ---- continued				
	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
C		Represent data using physical objects. DP3.1. Represent data. a. Attend to charts, graphs, or tables b. Represent a small data set with physical object. DP3.2. Interpret data. a. Attend to a display of data. b. Make observational statements about the data (identifying which category in the data set has the most).	Represent data using pictures and bar graphs. DP3.1. Represent data. a. Attend to charts, graphs, or tables b. Represent a small data set with physical object. c. Demonstrate awareness that symbols may be used to represent objects and events (e.g., picture of ice cream cones represent favorite flavor of ice cream). d. Display data using a variety of representations (e.g., pictures and bar graphs). DP3.2. Interpret data a. Attend to a display of data. b. Make observational statements about the data (identifying which category in the data set has the most).	Read and interpret information from <u>line plots</u> and graphs (<u>bar, line, pictorial</u>). Create tables and graphs. DP3.1. Represent data. a. Attend to charts, graphs, or tables b. Represent a small data set with physical object. c. Demonstrate awareness that symbols may be used to represent objects and events (e.g., picture of ice cream cones represent favorite flavor of ice cream). d. Display data using a variety of representations (e.g., pictures, bar graphs, line graphs and line plots). DP3.2. Interpret data. a. Attend to a display of data. b. Make observational statements about the data (identifying one category in the data set has the most). c. Read and interpret information from a line plot and graphs (bar, line, pictorial).
ST		MA 3 1.8	MA 3 1.8	MA 3 1.8
FR		VII.3	VII.3	VII a, b

2 Select and use appropriate statistical methods to analyze data				
	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
A		Analyze data for patterns.	Analyze data for patterns.	Analyze data for patterns.
Describe and Analyze Data		DP4.1. Describe and analyze data. a. Indicate an understanding of comparison words to describe collections in the school setting, (e.g., more/most/less/fewer/ same/none/larger/smaller/ middle). b. Use comparison words to describe collections in the school setting, (e.g., more/most/less/fewer/ same/none/larger/smaller/ middle).	Describe important features of the data. DP4.1. Describe and analyze data. a. Indicate an understanding of comparison words to describe collections in the school setting, (e.g., more/most/less/fewer/ same/none/larger/smaller/ middle). b. Use comparison words to describe collections in the school setting, (e.g., more/most/less/fewer/ same/none/larger/smaller/ middle). c. Determine which category has the most.	Describe important features of the data. Compare data on the chart or graph. DP4.1. Describe and analyze data. a. Indicate an understanding of comparison words to describe collections in the school setting, (e.g., more/most/less/fewer/ same/none/larger/smaller/ middle). b. Use comparison words to describe collections in the school setting, (e.g., more/most/less/fewer/ same/none/larger/smaller/ middle). c. Determine which category has the most. d. Describe the characteristics of categories and subcategories of data using comparison words (e.g., many boys wear hats to school and some girls wear hats to school). e. Compare categories of data using comparison words (e.g., more boys than girls wear hats to school).
ST		MA 3 1.6	MA 3 1.6	MA 3 1.6
FR		VII.b	VII.b	VII.b
B				Identify type of representation to use with data.
Identify Data Representation				DP5.1. Identify appropriate graphical representations of data. a. Recognize different ways to represent data. b. Identify graphical representation for a data set.
ST				MA 3 3.6
FR				VII a, b, e

3 Develop and evaluate inferences and predictions that are based on data				
	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
A		Discuss events related to students' experiences as likely or unlikely. DP6.1. Discuss and make predictions. a. Attend to discussions using prediction language such as "likely" and "unlikely." b. Discuss events related to the student's experiences using prediction language such as "likely" and "unlikely."	Given a set of data, propose and justify a conclusion that is based on the data. DP6.1. Discuss and make predictions. a. Attend to discussions using prediction language such as "likely" and "unlikely." b. Discuss events related to the student's experiences using prediction language such as "likely" and "unlikely." c. Justify a conclusion based on data (e.g., "why do we need to wear a coat today?").	Given a set of data, propose and justify a conclusion that is based on the data. Given a set of data make and justify prediction(s). DP6.1. Discuss and make predictions. a. Attend to discussions using prediction language such as "likely" and "unlikely." b. Discuss events related to the student's experiences using prediction language such as "likely" and "unlikely." c. Justify a conclusion based on data. d. Make decisions based on data. e. Make and justify a prediction based on data.
ST		MA 3 3.1, 3.3, 4.1	MA 3 3.1, 3.3, 4.1	MA 3 3.1, 3.3, 4.1
FR		VII.d	VII.c	VII.c

4 Understand and apply basic concepts of probability				
	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
A			Describe the degree of likelihood of events using words or symbols (i.e. certain, equally likely, impossible). DP7.1. Apply basic concepts of probability. a. Attend to another person using a chance device (e.g., spinner, dice) and to a person recording outcomes of a chance device. b. Attend to a person describe the likelihood of events (chance or daily) using words as "likely," "certain," "equally likely," "not likely." c. Describe the likelihood of events (daily) using words as "likely," "certain," "equally likely," "not likely."	Describe the degree of likelihood of events using words or symbols (i.e. certain, equally likely, impossible). DP7.1. Apply basic concepts of probability. a. Attend to another person using a chance device (e.g., spinner, dice) and to a person recording outcomes of a chance device. b. Attend to a person describe the likelihood of events (chance or daily) using words as "likely," "certain," "equally likely," "not likely." c. Describe the likelihood of events (daily) using words as "likely," "certain," "equally likely," "not likely." d. Participate in activities involving chance e. Collect and record outcomes of a simple event (e.g., toss a coin, roll a dice, spin a spinner). f. Describe the likelihood of a simple chance event (e.g., tossing coin, rolling die, spinning spinner) using words as "likely," "certain," "equally likely," "not likely" "impossible."
ST			MA 3 4.1	MA 3 4.1
FR			VII.g	VII.g

1 Understand measurable attributes of objects and the units, systems and processes of measurement				
	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
A		Compare and order objects according to their size, length or weight. ME1.1. Recognize, compare, and order attributes such as length and weight. a. Compare and communicate length of two objects directly using language such as “bigger,” “smaller,” “longer,” “shorter,” “taller” etc. b. Compare and communicate weight of two objects directly using language such as “heavier,” “lighter.”	Select and identify appropriate tool for the <u>attribute</u> being measured. ME1.1. Recognize, compare, and order attributes such as length and weight. a. Compare and communicate length of two objects directly using language such as “bigger,” “smaller,” “longer,” “shorter,” “taller” etc. b. Compare and communicate weight of two objects directly using language such as “heavier,” “lighter.” c. Engage in experiences to connect number with length using both conventional rulers and manipulative units that are standard units, such as centimeter cubes. d. Engage in experiences to connect number with weight using balance and spring scales. e. Select and identify appropriate tool for the attribute being measured.	Justify and use the appropriate unit of measure (linear, time, weight). ME1.1. Recognize, compare, and order attributes such as length and weight. a. Compare and communicate length of two objects directly using language such as “bigger,” “smaller,” “longer,” “shorter,” “taller” etc. b. Compare and communicate weight of two objects directly using language such as “heavier,” “lighter.” c. Engage in experiences to connect number with length using both conventional rulers and manipulative units that are standard units, such as centimeter cubes. d. Engage in experiences to connect number with weight using balance and spring scales. e. Select and identify appropriate tool for the attribute being measured. f. Show understanding of unit iteration (placing units end to end in some manner with no gaps) for length measurement. g. Use repetition of a single unit to measure something larger than the unit, such as measuring the length of room with a single meter stick. h. Use appropriate unit for the attribute being measured.
ST		MA 2 1.8	MA 2 1.4, 3.7	MA 2 1.4, 3.1, 4.1, 3.7
FR		VI.1.h	VI.1h	VI 1h

1 Understand measurable attributes of objects and the units, systems and processes of measurement ---- continued				
	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
C	Describe passage of time using terms such as today, yesterday, tomorrow.	Tell time to the nearest hour. Solve problems involving elapsed time (hours.)	Tell time. Solve problems involving elapsed time (hours).	Tell time. Solve problems involving elapsed time (hours).
	ME2.1. Develop concept of time. a. Listen and/or participate in calendar activities. b. Participate in daily schedules and start to identify important times in one's day (e.g., Identify what a student will do before lunch). c. Begin to describe passage of time using terms such as: "today," "yesterday," "tomorrow." d. Start to understand time is the duration of an event from beginning to its end.	ME2.1. Develop concept of time. a. Participate in calendar activities and start to identify days and months. b. Participate in daily schedules and start to identify important times in one's day (e.g., Identify what a student will do before lunch). c. Begin to describe passage of time using terms such as: "today," "yesterday," "tomorrow." d. Start to understand time is the duration of an event from beginning to its end. e. Describe passage of time by using a calendar to figure out how many more days to a special event (e.g., How many more days until a birthday). f. Identify or predict what comes next in a daily schedule. g. Develop concepts of " how long" for time units (e.g., second, minute and hour).	ME2.1. Develop concept of time. a. Participate in calendar activities and start to identify days, months and years. b. Participate in daily schedules and start to identify important times in one's day (e.g., Identify what a student will do before lunch). c. Begin to describe passage of time using terms such as: "today," "yesterday," "tomorrow." d. Start to understand time is the duration of an event from beginning to its end. e. Describe passage of time by using a calendar to figure out how many more days to a special event (e.g., How many more days until a birthday). f. Identify or predict what comes next in a daily schedule. g. Develop concepts of " how long" for time units (e.g., second, minute and hour).	ME2.1. Develop concept of time. a. Participate in calendar activities and start to identify days, months and years. b. Participate in daily schedules and start to identify important times in one's day (e.g., Identify what a student will do before lunch). c. Begin to describe passage of time using terms such as: "today," "yesterday," "tomorrow." d. Start to understand time is the duration of an event from beginning to its end. e. Describe passage of time by using a calendar to figure out how many more days to a special event (e.g., How many more days until a birthday). f. Identify or predict what comes next in a daily schedule. g. Develop concepts of " how long" for time units (e.g., second, minute and hour).
	ME2.2. Develop ways to measure time. a. Listen to others "talk Time" (e.g., "It is 2:30, time to get ready to go home").	ME2.2. Develop ways to measure time. a. Listen to others "talk Time" (e.g., "It is 2:30, time to get ready to go home"). b. Time familiar events in ones life with a timer (e.g., brushing teeth, eating lunch). c. Identify actual time to the hour. d. Identify time for an event that is one hour away from the actual time.	ME2.2. Develop ways to measure time. a. Listen to others "talk Time" (e.g., "It is 2:30, time to get ready to go home"). b. Time familiar events in ones life with a timer (e.g., brushing teeth, eating lunch). c. Identify actual time to the hour. d. Identify time for an event that is one hour away from the actual time. e. Tell time.	ME2.2. Develop ways to measure time. a. Listen to others "talk Time" (e.g., "It is 2:30, time to get ready to go home"). b. Time familiar events in ones life with a timer (e.g., brushing teeth, eating lunch). c. Identify actual time to the hour. d. Identify time for an event that is one hour away from the actual time. e. Tell time. f. Solve problems involving elapsed time (e.g., "If it was 7:30 when David left home, what time will he arrive to school if it takes him one hour to travel to school).
	ST MA 2 3.3	MA 2 , 5 3.3	MA 2 , 5 3.3	MA 2 , 5 3.3
	FR VI.1.g & h	VI.1.g & h, IX d	VI.1.g & h, IX d	VI.1.g & h, IX d

1 Understand measurable attributes of objects and the units, systems and processes of measurement ---- continued				
	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
D	Identify penny, nickel, dime and quarter. Know value of penny, nickel, dime and quarter.	Identify penny, nickel, dime and quarter. Know value of penny, nickel, dime and quarter. Count coins to \$1.00.	Know value of penny, nickel, dime and quarter. Count coins to \$1.00.	Select coins/bills needed for purchase. Count coins to \$1.00. Make change.
	ME3.1. Identify coins. a. Match or identify a penny. b. Match or identify a nickel. c. Match or identify a dime. d. Match or identify a quarter.	ME3.1. Identify coins. a. Match or identify a penny. b. Match or identify a nickel. c. Match or identify a dime. d. Match or identify a quarter.	ME3.1. Identify coins. a. Match or identify a penny. b. Match or identify a nickel. c. Match or identify a dime. d. Match or identify a quarter.	ME3.1. Identify coins. a. Match or identify a penny. b. Match or identify a nickel. c. Match or identify a dime. d. Match or identify a quarter.
	ME3.2. Know value of coins. a. Identify the value of a penny as 1¢. b. Identify the value of a nickel as 5 pennies. c. Identify the value of a dime as 10 pennies. d. Identify the value of a quarter as 25 pennies.	ME3.2. Know value of coins. a. Identify the value of a penny as 1¢. b. Identify the value of a nickel as 5 pennies. c. Identify the value of a dime as 10 pennies. d. Identify the value of a quarter as 25 pennies.	ME3.2. Know value of coins. a. Identify the value of a penny as 1¢. b. Identify the value of a nickel as 5 pennies. c. Identify the value of a dime as 10 pennies. d. Identify the value of a quarter as 25 pennies.	ME3.2. Know value of coins. a. Identify the value of a penny as 1¢. b. Identify the value of a nickel as 5 pennies. c. Identify the value of a dime as 10 pennies. d. Identify the value of a quarter as 25 pennies.
Count and Compute Money		ME3.3. Count money. a. Demonstrate different kinds of counting (e.g., by ones, by fives, by 10s, by 25s).	ME3.3. Count money. a. Demonstrate different kinds of counting (e.g., by ones, by fives, by 10s, by 25s). b. Add collections of like coins together to a sum no greater than \$1.00 (e.g., ten dimes or four quarters) . c. Find possible combinations of coins to equal 25¢, 50¢.	ME3.3. Count money. a. Demonstrate different kinds of counting (e.g., by ones, by fives, by 10s, by 25s). b. Add collections of like coins together to a sum no greater than \$1.00 (e.g., ten dimes or four quarters) . c. Find possible combinations of coins to equal 25¢, 50¢. d. Matching coin combinations to cents and dollar notation. e. Add coins together to \$1.00. f. Identify the value of the coins added to \$1.00 as equaling one dollar bill. g. Make change.
			ME3.4. Use money. a. Select needed coins or bills to make a purchase.	ME3.4. Use money. a. Select needed coins or bills to make a purchase.
ST	MA 1, 5	MA 1, 5	MA 1, 5	MA 1, 5
FR	IV 3d	IV 3d	IV 3d	IV 3d

2 Apply appropriate techniques, tools and formulas to determine measurements				
	GRADE K -2	GRADE 3 - 5	GRADE 6-8	GRADE 9-12
A		See grades 3-5 1.1	See grades 6-8 1.1	Use tools to measure (size, temperature, time, weight and capacity) to the nearest unit.
Use Standard or Non-Standard Measurement				<p>ME4.1. Recognize, compare, and order attributes such as length and weight.</p> <p>a. Compare and communicate length of two objects directly using language such as “bigger,” “smaller,” “longer,” “shorter,” “taller” etc.</p> <p>b. Compare length transitively; (length of two objects can be compared by representing each using string or paper strips).</p> <p>c. Compare and communicate weight of two objects directly using language such as “heavier,” “lighter.”</p> <p>d. Engage in experiences to connect number with length using both conventional rulers and manipulative units that are standard units, such as centimeter cubes.</p> <p>e. Engage in experiences to connect number with weight using balance and spring scales.</p> <p>f. Select and identify appropriate tool for the attribute being measured.</p> <p>g. Show understanding of unit iteration (placing units end to end in some manner with no gaps) for length measurement.</p> <p>h. Use repetition of a single unit to measure something larger than the unit, such as measuring the length of room with a single meter stick.</p> <p>i. Use appropriate unit for the attribute being measured.</p> <p>ME4.2. Use tools to measure (size, temperature, time, weight, and capacity) to the nearest unit.</p>
ST	MA 2 3.3	MA 2 , 5 3.3	MA 2 , 5 3.3	MA 2 , 5 3.3
FR	VI.1.g & h	VI.1.g & h, IX d	VI.1.g & h, IX d	VI.1.g & h, IX d